

## Initial Feedback from Group Rotations

Suggestion	Action Taken
Use a physics example for "Application". An engineering example as a hook perhaps? Maybe have an activity where students can 'explore' vectors and discover dot product on their own, if they can?	Incorporated "Shadow Activity" which brings a physical example into the classroom, and allows them to explore the formula themselves. TedEd Module was added as the hook.
Add visuals, to show the vectors tail to tail, so students have a visual to refer to when thinking about 'dot product'	Visual were added through the TedEd Module and the in-class PowerPoint.
Could include a question about what happens when vectors are parallel (as far as dot product goes)	This issue is addressed in the TedEd Module, and in the review clicker questions at the beginning of the class.
For "To find the dot product between the vectors $a$ and $b$ , place the vectors tail to tail and find the angle $\theta$ between them. The dot product is then:" you can use the smartboard to display the vectors and even invite the students to come up and place them tail to tail. As a hook, you can show the relationship between the the dot product and physics	We did not include this suggestion, as we felt that enough visuals were now provided with the TedEd module and the in class lesson. The students also have a chance to be involved through the "Shadow Activity".
Include a short refresher on vector properties at the start of the lesson.	Clicker review questions were added at the beginning of the class
I like the connection to physics, but the idea of taking components of forces might be a bit confusing for students who have never seen it before. I like how you have students think about parallel and perpendicular vectors on their own.	Forces were dropped from the lesson and the focus of the activity was instead changed to projections

## Feedback from Class Presentation

Suggestion	Action taken
Make the activity into a lab activity	This was already partially done, through the investigative "Shadow Activity" (its not a formal lab but still a discovery based learning activity) so we felt it was adequate the way it was.
Having less writing on the handout and then demonstrating it would be more effective. I didn't think the handout was too wordy; I think students taking calculus can handle that amount of text. Its lots to read, but for the student who can't retain oral instructions (aka me) you need something to fall back on to figure out what to do or you become lost, which happened to me countless times in class without written instructions. Kids are going to read it or ask a friend to figure out the activity.	We will make sure to have a demo of the activity for students before starting the investigation and will keep the original worksheet for the other students
Is there another thing you could use instead of survey monkey? Pulling out computers just for a survey monkey might not be the best use of time. Instead of a survey monkey, it may be easier in a classroom setting to give students a hard copy of the survey or scantron and have them just check it off Ticket out the door is an effective way to assess for learning. I like the use of 1 to 5 rating scale for understanding.	The Survey Monkey did seem rather unnecessary. Rather than doing a Survey Monkey the handout will be collected at the end of the activity and an assessment will be made on the students knowledge learnt through the lesson based on what they have completed.
Get the students to explain what 'human errors' could result in different solutions	We decided against making this a formal part of the lesson, however it may be something that the teacher wishes to lead a discussion about. Student's answers will be slightly different for the activity and its a good opportunity for them to witness the potential errors in experiments.